PUGET SOUND NAVAL SHIPYARD

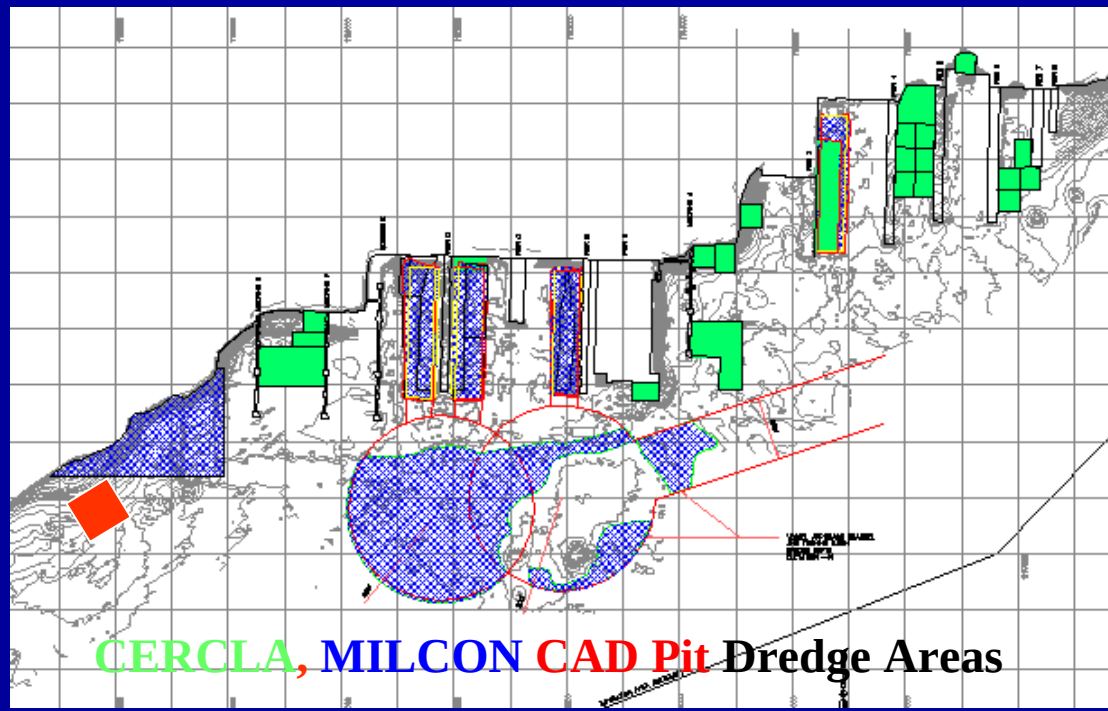
CONFINED AQUATIC DISPOSAL OF CONTAMINATED AND UNSUITABLE MARINE SEDIMENTS

OU B Marine Remedial Action and
FY00 MCON Project P-338

Project Location

Overview of the Project

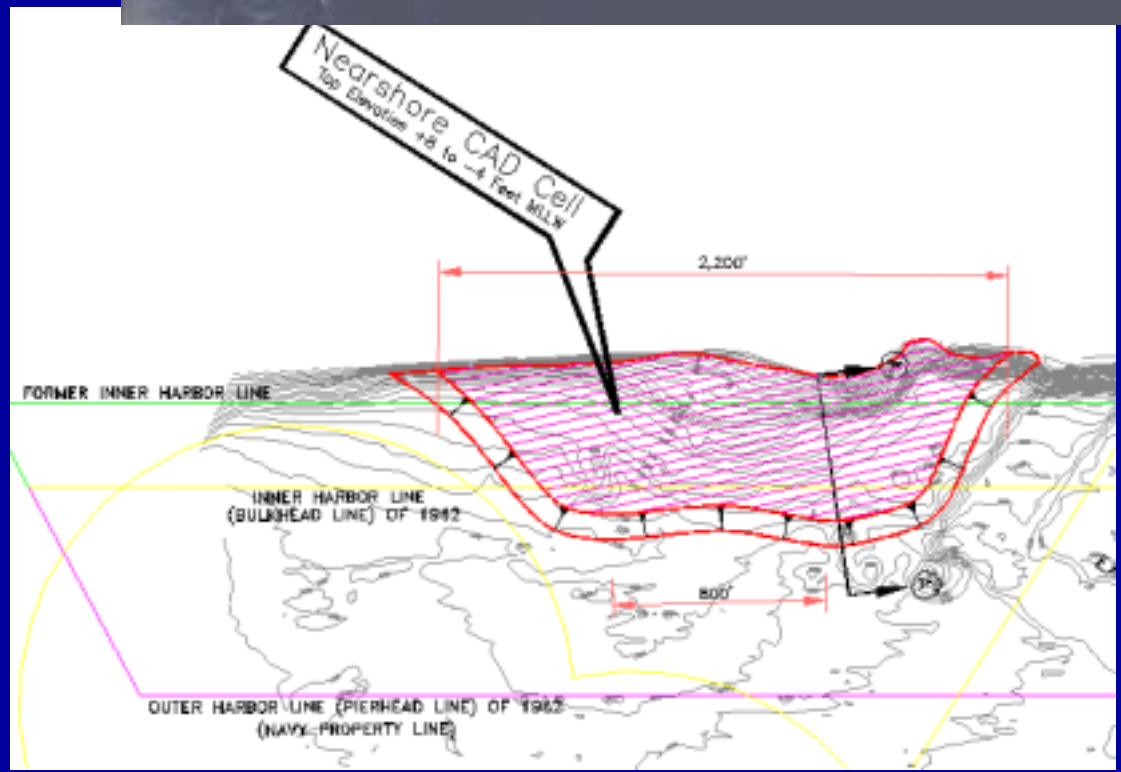
- Combines Two Projects Under a Single Contract
- Dredge Volumes
  - 150,000 cy CERCLA
  - 340,000 cy MILCON
  - 350,000 cy Pit CAD
- Required to Minimize Operational Disruptions



CERCLA, MILCON CAD Pit Dredge Areas

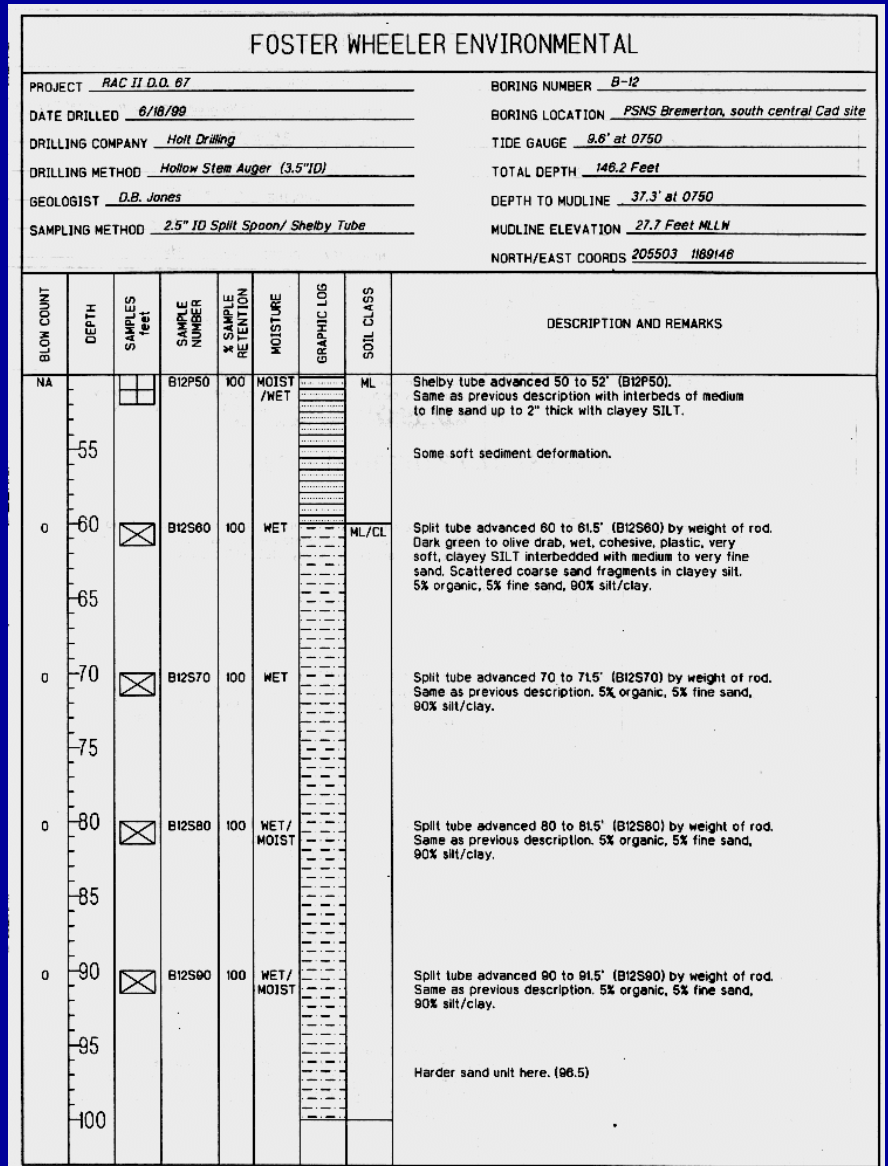
Early Design Development

- Draft FS Alternatives
  - Nearshore CAD
  - Pit CAD “Offsite”
    - Prohibited by DNR on State Lands
- Preferred Alternative
  - Nearshore CAD
    - Subtidal Berm/Dike
    - Sand Cap
    - Create New Intertidal Habitat



Nearshore CAD Design Development

- Performed Geotechnical Boring Program
- Results:
  - Very Soft Sediments
  - "Zero" Blow Count to Depth of 130 feet



FOSTER WHEELER ENVIRONMENTAL

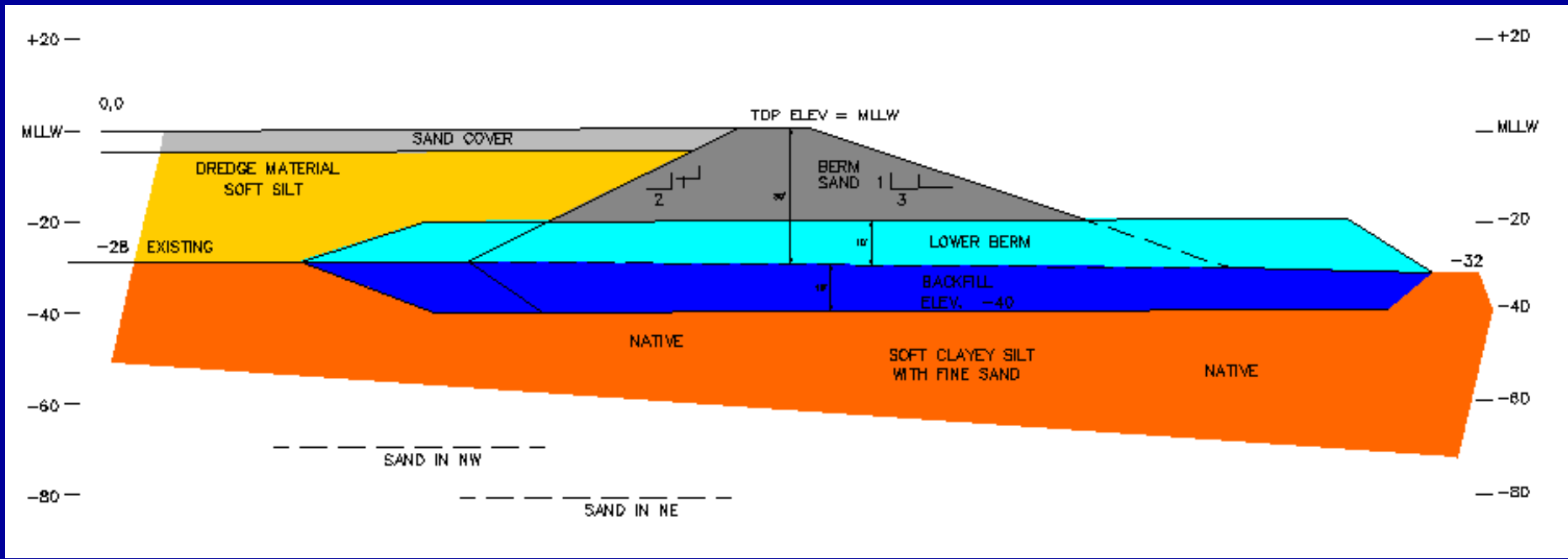
PROJECT RAC II D.O. 67
DATE DRILLED 6/18/99
DRILLING COMPANY Holt Drilling
DRILLING METHOD Hollow Stem Auger (3.5"ID)
GEOLOGIST D.B. Jones
SAMPLING METHOD 2.5" ID Split Spoon/ Shelby Tube

BORING NUMBER B-12
BORING LOCATION PSNS Bremerton, south central Cad site
TIDE GAUGE 9.6' at 0750
TOTAL DEPTH 146.2 Feet
DEPTH TO MUDLINE 37.3' at 0750
MUDLINE ELEVATION 27.7 Feet MLLW
NORTH/EAST COORDS 205503 1169148

BLOW COUNT	DEPTH	SAMPLES feet	SAMPLE NUMBER	% SAMPLE RETENTION	MOISTURE	GRAPHIC LOG	SOIL CLASS	DESCRIPTION AND REMARKS
NA	55		B12P50	100	MOIST /WET		ML	Shelby tube advanced 50 to 52' (B12P50). Same as previous description with interbeds of medium to fine sand up to 2" thick with clayey SILT. Some soft sediment deformation.
0	60		B12S60	100	WET		ML/CL	Split tube advanced 60 to 61.5' (B12S60) by weight of rod. Dark green to olive drab, wet, cohesive, plastic, very soft, clayey SILT interbedded with medium to very fine sand. Scattered coarse sand fragments in clayey silt. 5% organic, 5% fine sand, 90% silt/clay.
0	65							
0	70		B12S70	100	WET			Split tube advanced 70 to 71.5' (B12S70) by weight of rod. Same as previous description. 5% organic, 5% fine sand, 90% silt/clay.
0	75							
0	80		B12S80	100	WET/ MOIST			Split tube advanced 80 to 81.5' (B12S80) by weight of rod. Same as previous description. 5% organic, 5% fine sand, 90% silt/clay.
0	85							
0	90		B12S90	100	WET/ MOIST			Split tube advanced 90 to 91.5' (B12S90) by weight of rod. Same as previous description. 5% organic, 5% fine sand, 90% silt/clay.
	95							Harder sand unit here. (96.5)
	100							

Nearshore CAD Design

- Soft Foundation Required:
  - Pre Excavation
  - Buttressing
  - Staged (2 yr)Construction for Consolidation
- Consequence was:
  - Unacceptable Delay
  - Costly Solution
  - Limited Capacity



CAD Design Development

- Issues w/ Nearshore CAD
  - Construction Time
    - MILCON Required a June 2000 Start
    - Limited Capacity
    - Costly
  - Loss of Habitat
- Develop Cost Model
  - Upland Disposal of Unsuitable MILCON of up to $10M Greater than Pit Disposal

Was There a Better Way?

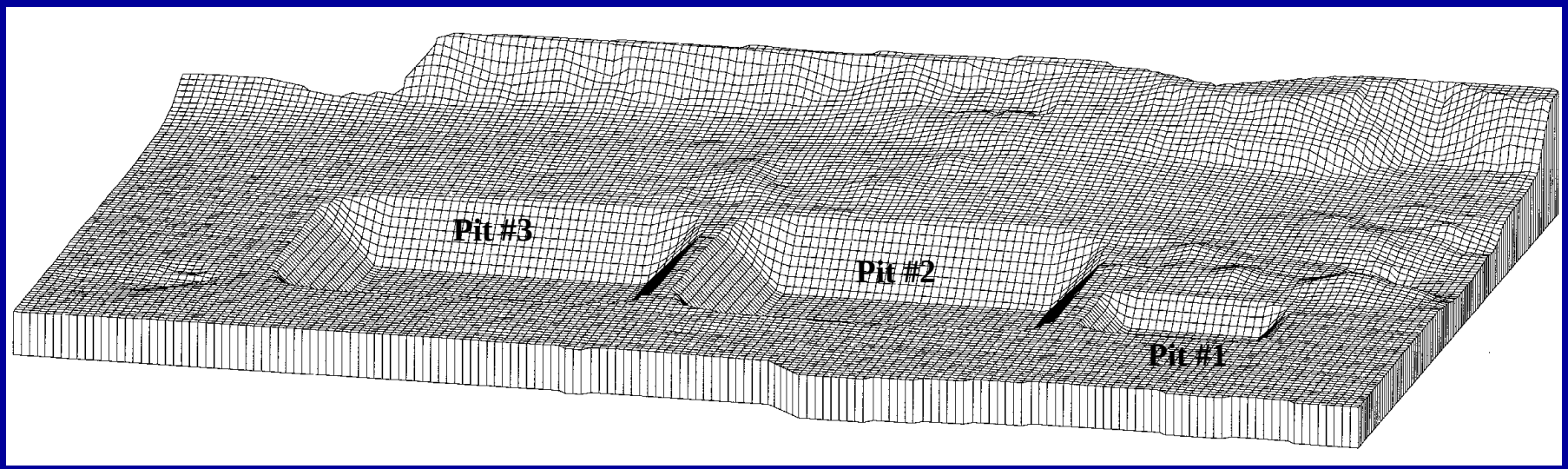
CAD Design Development

- Solution
  - Navy Has Fee Simple Ownership to Outer Harbor Line
  - Identify Pit CAD Alternative on Navy Property
  - DNR Issue Rendered Moot

Pit CAD Design Development

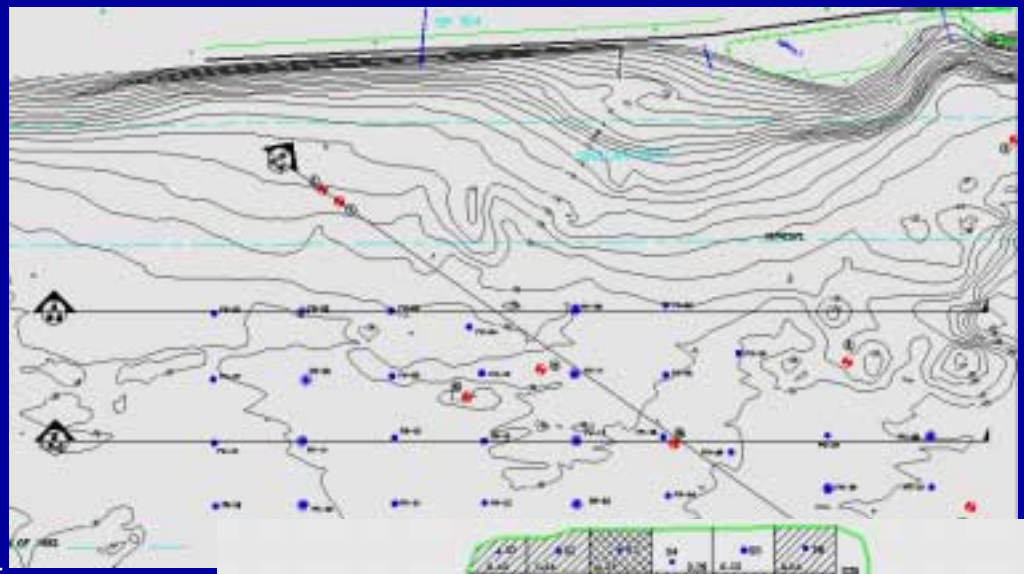
- First: Sized for
  - MILCON Unsuitable Volume
  - CERCLA Volume
- Second: Pit Surface Sediments Assumed Unsuitable for Open Water Disposal
- Solution: A Three Pit System

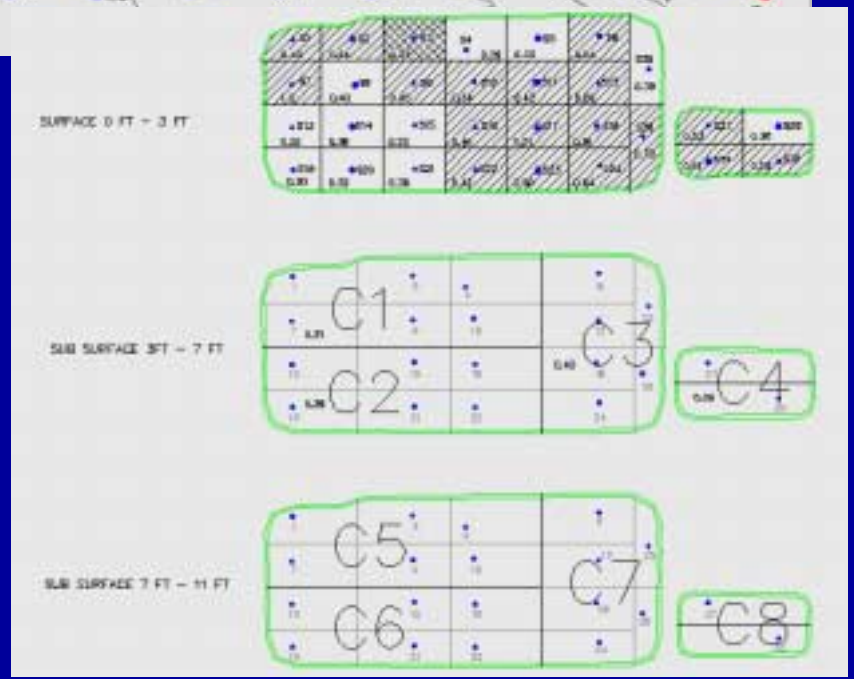
Sequential Excavation and Disposal



Pit CAD DMMP Sampling

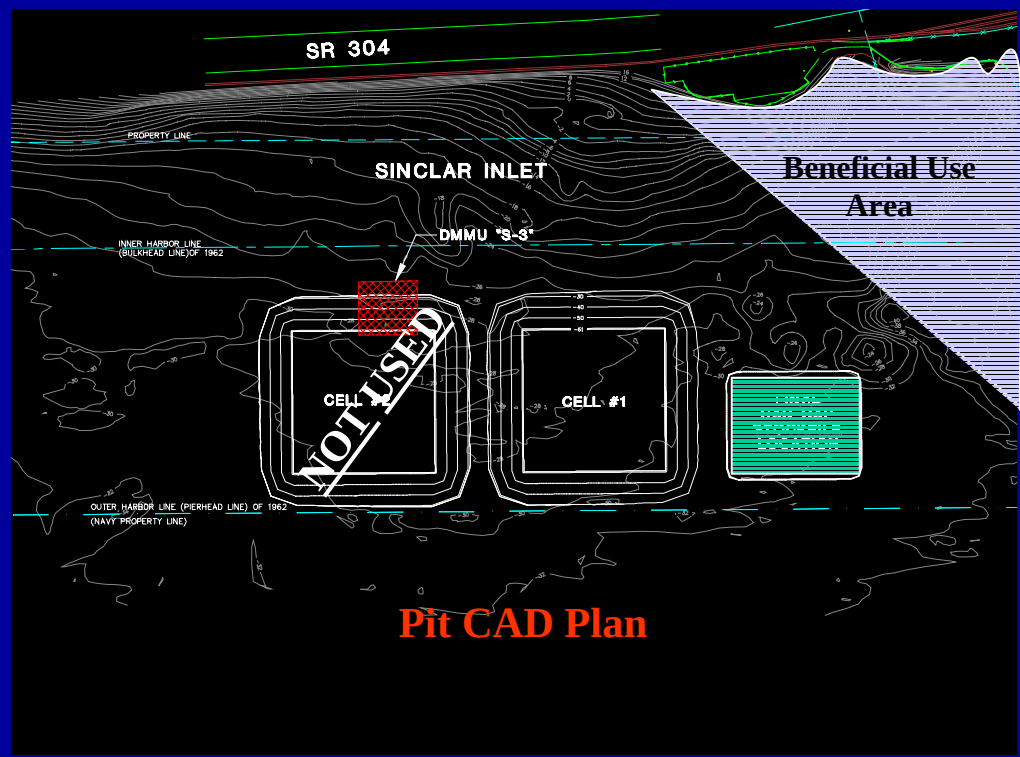
- DMMP Process
  - Based on “Worst Case” Sizing of Pit or Close to 700,000 cy
- Required
  - 29 Samples 0-3 ft
  - 18 Samples 3-7, 7-18 ft
  - No Sampling below 18
  - Ran Chemical & Biological Tests on All
- Results
  - One 4,000 cy Surface Unit Failed





Final Pit CAD Design

- Criteria
  - Design had to Assume "Worst Case" Scenario
  - MILCON Resampled Able to Reduce Disposal Volume to 345,000 cy
- Concurrently Obtained OK for Beneficial Use of Over 85,000 cy for:
  - Stockpile for Final CAD Cap
  - Nearshore Habitat Enhancement & CERCLA Cap



Pit CAD Plan

Pit CAD Construction Phase

- Subcontract Evaluation/Selection Process Initiated
  - General Construction Selected
- Equipment mobilized
  - DB Los Angeles - 225 ton - 25 cy environmental bucket
  - DB Seattle - 165 ton - 24 cy environmental bucket
  - DB Olympia - 80 ton - APE 200 vibratory hammer
  - DB Tacoma - 37 ton - 4.5 cy clamshell bucket
  - 3 split-hull bottom dump barges
  - 2 flat deck barges
  - 2 tug boats
  - 1 bathymetric survey/water quality monitoring work boat
  - office trailers

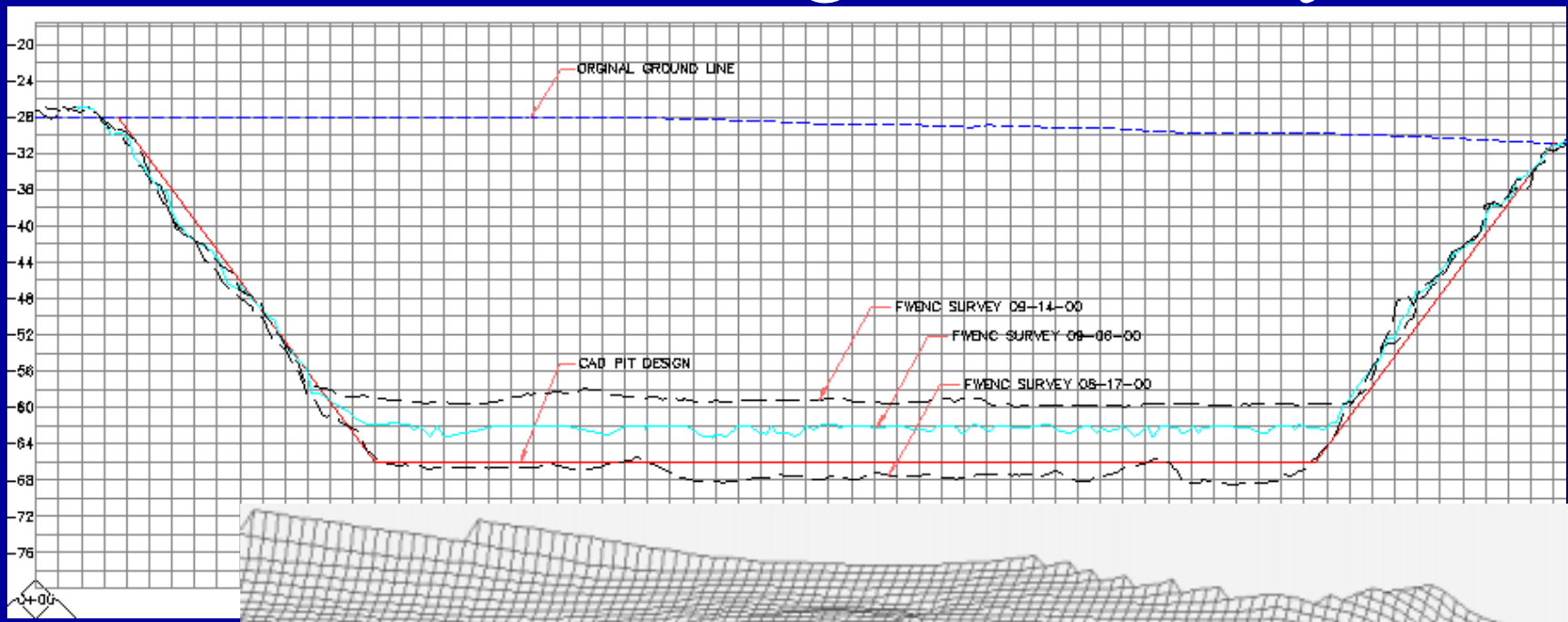
Other Concurrent Approvals

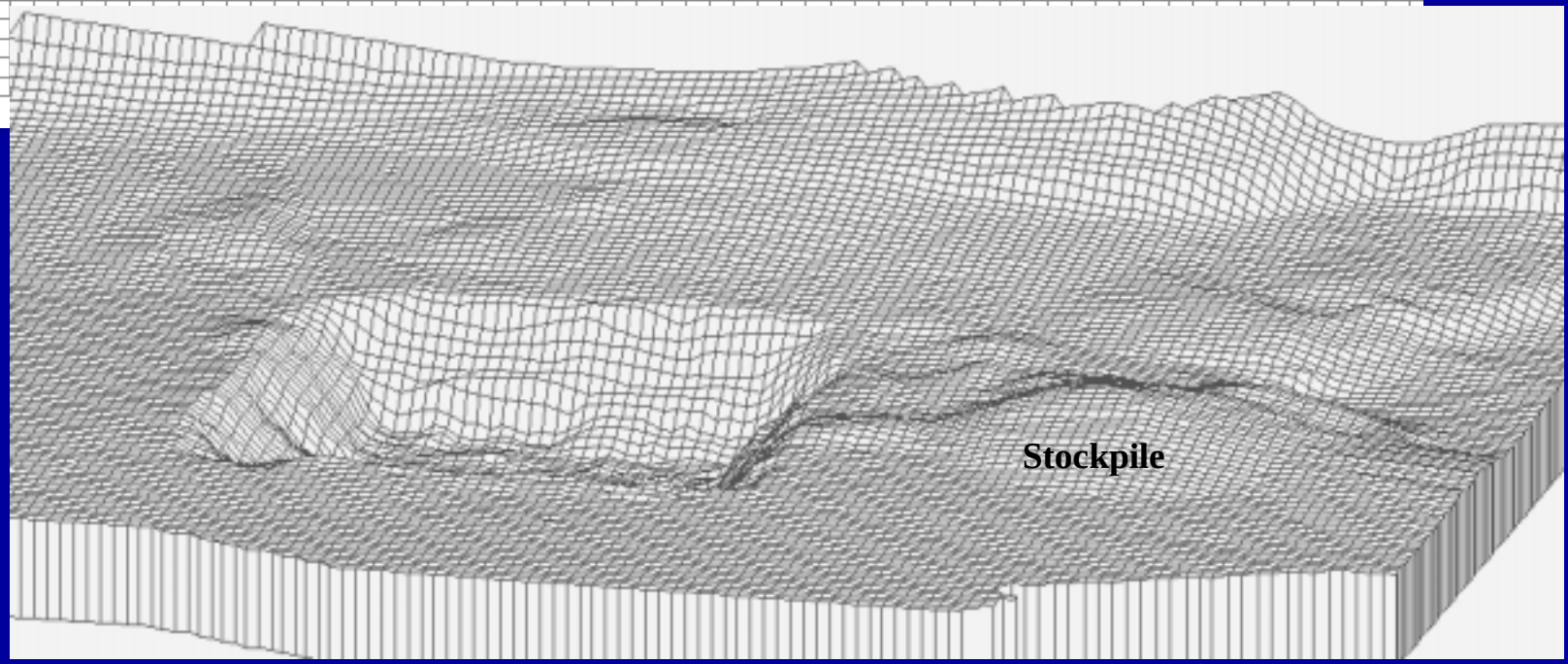
- ARARS with
  - State Fish and Wildlife
  - Ecology
  - EPA
- Endangered Species Act (ESA)
  - Prepared Biological Assessment
- Tribes

Pit CAD Construction

Pit CAD Construction

Pit CAD Progress Surveys

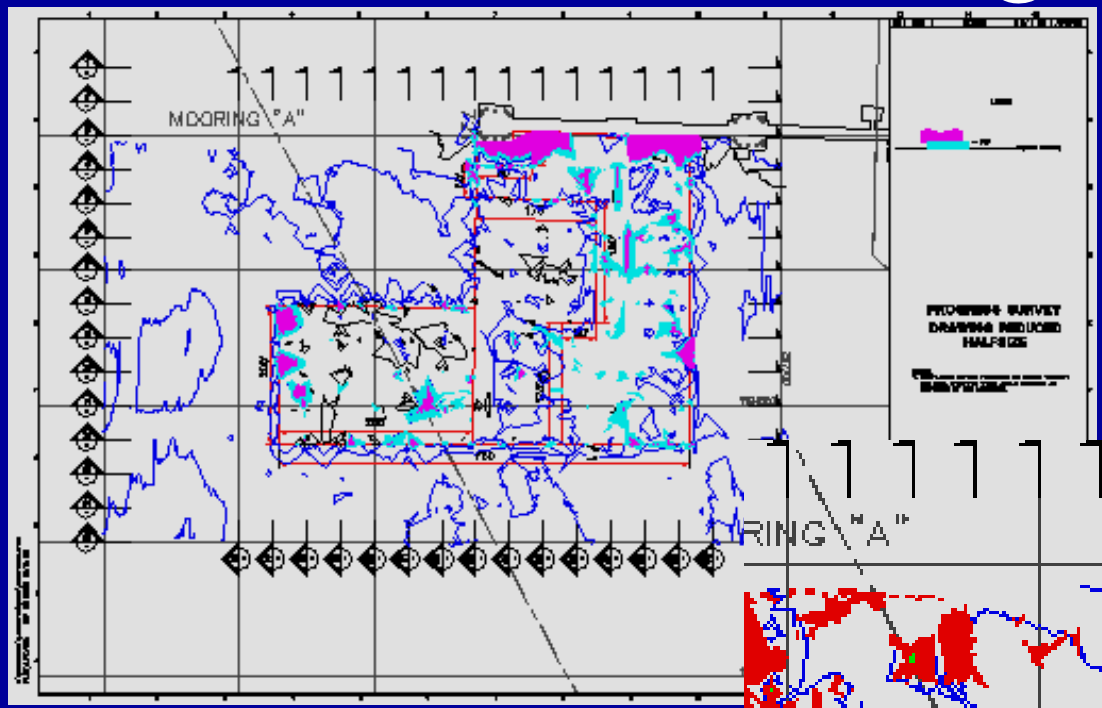


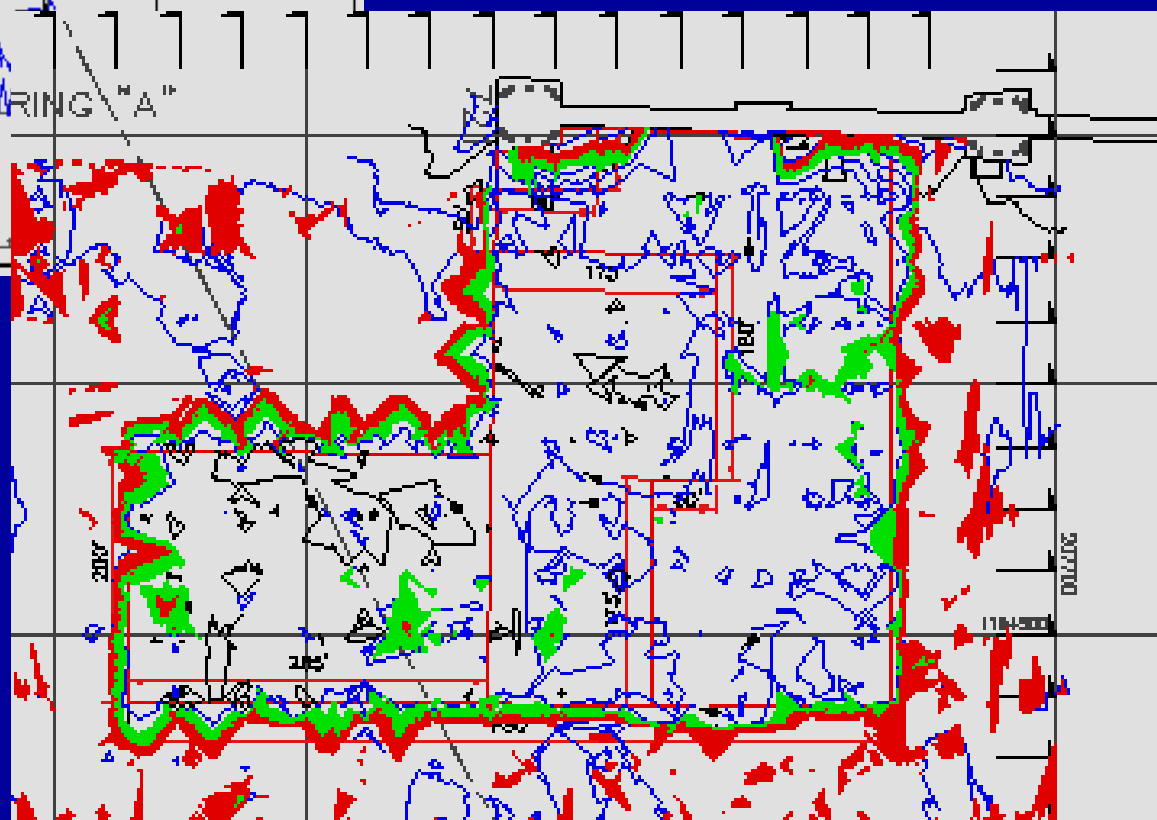


Survey and Water Quality Monitoring

- Daily Bathymetric Surveys
- Extensive Water Quality Monitoring
  - In Situ STD, Oxygen, Turbidity
  - Current Profiling
  - Chemical Analysis
- Pre Dredge Side Scan for Debris/Gas Cylinders

Remediation Progress Surveys





- Dual Goals
  - Meet Required Dredge Prism
  - Meet Cleanup Criteria

Where Are We Now?
Where Are We Headed?

- Pit CAD Completed on August 15th
- CERCLA Dredging Underway
- MILCON Dredging Underway
- On Schedule to Complete Dredging by February, 2001
- Place Interim CAD Sand Cap by March 15, 2001
- Allow Pit to Consolidate During Fisheries Closure
- Complete CAD Cap in July, 2001

Working Together for a Successful Project